By Cheerie R. Patneaude

A stellar career adds another star

James Graver, an Aerospace Quality Specialist at White Sands Test Facility, has been awarded three NASA Group Achievement Awards, two commendations and three achievement awards, and his name was flown to the Moon by Apollo 11 astronauts.

Recently, the Washington International Group contractor added another prestigious honor to his list. Graver was presented NASA's Mission Accomplished Xtraordinaire (MAX) award and the Star award from the Space Shuttle Program.

NASA bestows the MAX award upon Safety, Reliability and Quality Assurance (SR&QA) professionals who have made significant contributions leading to the success of a recent human spaceflight mission. Johnson Space Center Director Lt. Gen. Jefferson D. Howell, Jr., and Deputy Director Randy Stone select and award this honor to only one individual per mission.

The Space Shuttle Program Office presents the Star awards to individuals who have exhibited initiative and dedication in ensuring successful spaceflight. Recognizable performance is not restricted to crew safety and shuttle operations, but also includes payload activity, extravehicular activity and International Space Station assembly.

So what did Graver do that landed him the awards?

When asked, the soft-spoken Graver said, "I'm just trying to do my job." But in the course of doing his job, he spotted and helped correct a major problem with an Orbital Maneuvering Subsystem (OMS) engine.

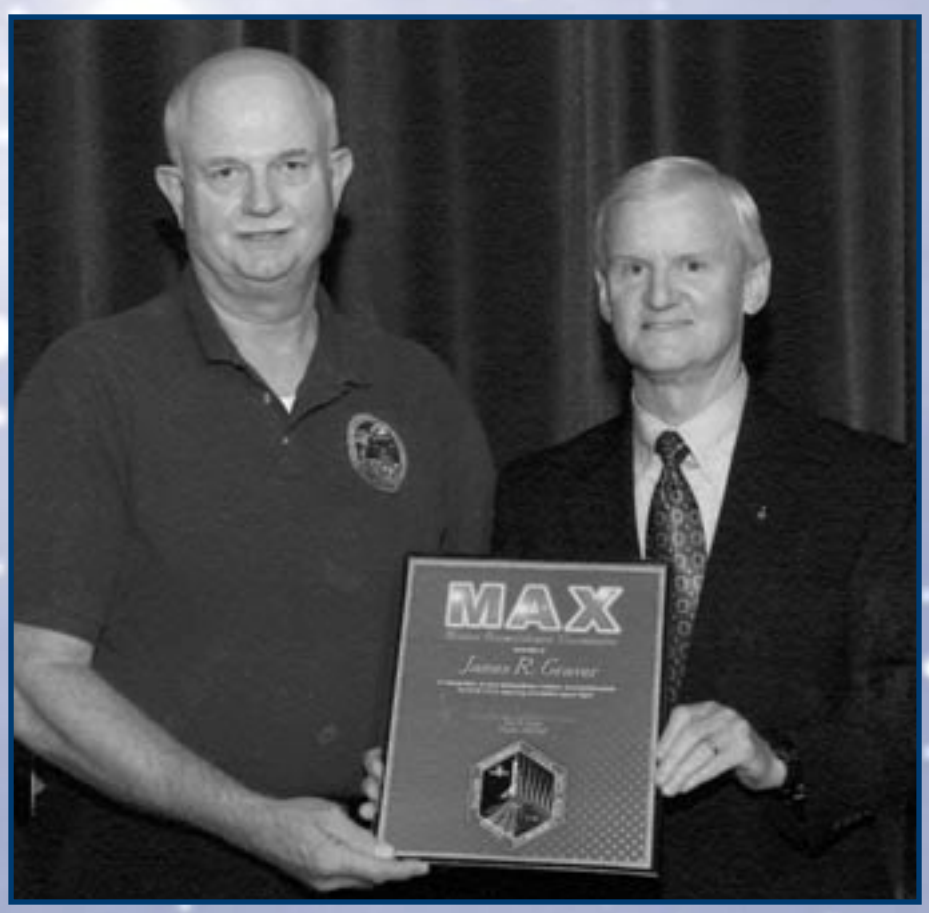
"I noticed a problem during routine reassembly of the engine," Graver said. "Bolts in the propellant feedline flanges at several locations on the engine were being tightened but, during the final torque sequence, a bolt snapped off."

"That was alarming by itself," he said. "But when a second bolt was inserted and it too broke when being tightened, it immediately sent up a red flag."

Graver halted the assembly process to make sure that proper documentation of the anomaly was initiated. He then reported the problem to Debra Chowning, a WSTF Quality Engineer.

"Jim's confidence in his awareness of the system and the problem was invaluable in looking at inspection from an independent perspective," Chowning said. "Although there was a shuttle ready to fly within two weeks (STS-110), we knew that the problem had to be fixed. Even if the launch date was impacted, we felt that the shuttle would be safer and more reliable afterwards. The NASA Problem Action Center agreed with us."

An intensive investigation revealed the cause of the anomaly that Graver had spotted. It turned out that, during a redesign of the propellant-joint seals a few years ago, a new high-strength precision bolt was tightened to a higher torque value than the old ones. Then, an assembly-drawing mix-up caused the wrong bolts to be assigned the wrong torque values. The bolts became over-stressed and, as Graver witnessed, snapped off.



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James Graver, left, accepts his Mission Accomplished Xtraordinaire (MAX) award from John Casper, former Director of Safety, Reliability & Quality Assurance.

Meanwhile, Space Shuttle *Atlantis* was being prepared for STS-110. An exhaustive search of engine assembly documentation and physical inspection of the shuttle's engines found that the incorrect bolts were indeed installed in both engines of the shuttle. A team of engineers and technicians at WSTF developed and demonstrated a technique for sequentially replacing the discrepant bolts without compromising the integrity of the seal. This meant the bolts could be replaced without removing the engines or conducting high-pressure leak checks. Such procedures would have meant a significant delay in the mission.

Technicians at KSC were then able to replace *Atlantis*' bolts right on the launch pad, and the engines were cleared for flight. All other OMS engines throughout the shuttle fleet, including spares, were also inspected. Assembly drawings were updated to ensure that a similar problem did not occur again.

"You just can't top the experienced worker," said Raul Estrada, a Honeywell Test Cell Technician in the WSTF Propulsion Department. "I respect Jim very much."

Graver takes the recognition in stride. However, his stellar 40-year career speaks volumes. He began in 1962 with Grumman Aerospace in New York. Graver worked on the Apollo Lunar Module and several military aircraft programs – including the Navy A-6 Intruder, F-14 Tomcat and E-2C Hawkeye, as well as the Army OV-1 Mohawk – before he arrived at WSTF in 1975. His first job at the test facility was with the Propulsion Test Department.

Graver worked on the Shuttle OMS Engine and Forward Reaction Control Subsystem. He also worked in the Space Shuttle Depot for maintaining and repairing Primary/Vernier Reaction Control Subsystem Thrusters. This varied experience created a wealth of knowledge to apply to his current responsibilities.

When Graver isn't taking care of rocket engines on the space shuttle, he spends time with his wife Mary Ann, three daughters and six grandchildren.

"Jim's extensive aerospace experience gives him the outstanding ability to identify problems in critical items, processes and tests by asking the right questions when something doesn't seem right to him," said Richard Cummings, JSC/Washington Group International Manager.

Joseph Fries, NASA WSTF Manager, said, "Jim is an outstanding employee who is being recognized for his contributions to the Space Shuttle Program. I am proud of the work that he has done over the years."

Graver believes the key to his success has been simply sticking to the basics. "It takes a lot of dedication to really learn a job," he said. "Concentrate on your job and be the best at what you do. Take the opportunity to learn and, when you learn something new, share it with your coworkers. I enjoy passing on my knowledge to them." ❖